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ENABLING THE RED QUEEN EFFECT FROM ACCOUNTABILITY: EVIDENCE ON CORRUPTION CONTROL

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Enabling the Red Queen effect from Accountability: Evidence on corruption control

Abstract: Regarding the relationship among governance outcomes, this paper aims to verify if the results of voice and accountability had significant change and the control of corruption maintained after the Arab Spring. The literature review on public administration, economics, and political sciences stated that the rule of law should impact accountability. In turn, accountability should control corruption. The Arab Spring period occurred in synergy with the global governance movement and should explain the maintenance of corruption control. This investigation is a quantitative regression study based on multivariate panel data of nine years covering 198 countries and 1,782 observations. The paper's main contribution is that the accountability's advances active the Red Queen effect to keep corruption controlled. After the Arab Spring period, accountability advanced in the world because of the global governance movement. Governmental accountability practitioners' actions should increase disclosing information, consistent reports, objective communications, and independent audits to ensure citizen engagement.

1. Introduction

Accountability stands as the democratic responsibility of the governmental authorities between political elections' period that should be judged by law in trial courts and by the vote in the ballot box (ABREU e GOMES, 2021). The rule of law should guarantee the accountability result. No human being can be punishable without an ordinary judgment, be above the law, and dissonance with the country constitution and its general principles (BINGHAM, 2011).

Therefore, the rule of law is fundamental for voice and accountability because of individual or narrow group interests under hiding behind the law or knowingly distorting it (GAN, 2020). According to Bozeman, Molina Jr, & Kaufmann (2018), unfortunately, the major deep corruption occurs by the legal direct laws' violation. For instance, the authoritative actions using government or public policy structures to thwart society's core public values.

Transparency and participatory initiatives should contribute to accountable results to constrain the corruption, such as the government's disclosure of information, clearly publication, consistent report, objective communication, independence audit, citizen engagement, and the rule of law (ABREU, 2017; GIFT, 2021). Hence, the ruled can check the ruler actions to avoid the private gain at the public's expense under a behaviour's pattern that deviates from corruption evidence (ABREU e GOMES, 2021).

The literature classifies the Arab Spring (started in Tunisia in 2010 and spread in Middle Eastern and North African) as the most recent wave (ended in 2012) of democratisation (fourth) (ABUSHOUK, 2016). Nevertheless, Springborg (2011, p. 432) in the early doubted if Arab Spring 'might reverse what has heretofore been the vicious cycle of inadequate voice and accountability' in Middle Eastern and North African.

According to Abushouk (2016), Middle Eastern and North African still a grey zone of autocratic and democratic features combined in diverse forms of governments. Grinin and Korotayev (2019) argued that the Middle Eastern and North African democratisation steam came from a global movement for more voice and accountability. As Schmitter and Sika (2017) stated, the synergic world democratic movement could contain the corruption level by improving accountability actions.

Corruption is a parasitical system subject to evolution conditionals (HARLING, 1995). Jain (2001) stood four main parasite stakeholders could involve in corruption focused on receiving benefits according to its ability to influence each decision-maker. First, part of the population elects the Political Leaders and the Legislators for benefits. Second, the Legislators enacts laws for benefits. Third, the Political Leader make public policy and appoint Bureaucrats for benefits. Fourth, the Bureaucrats provide services for benefits.

Hence, the benefits opportunities motivate parasite corruption practices (JAIN, 2001; VILHENA, 2018). As Vilhena (2018, p. 54) stated, corruption is 'similar to a parasite, can be controlled, but not entirely eradicated.' The judiciary should ensure the rule of law to achieve more accountability

for the political and the elites. In this process, the control of the everlasting parasites constrains the corruption level (VILHENA, 2018).

In biological conditionals, the parasites search for evolutionary strategies to maintain their *status quo,* Van and Valen (1973) named The Red Queen Hypothesis. In sum, the organisms face their evolutionary process to keep community powers' balance, such as the strategies' adoption of genotype and phenotype changes, migration and speciation adaptive, and species and population growth rates (LIOW, VAN VALEN e STENSETH, 2011).

The term Red Queen is related to a character mentioned by Carroll (1917, p. 33) in the Through the Looking Glass book, who famously said, 'it takes all the running you can do, to keep in the same place.' According to Chakravorty and Hales (2016), the achievement of long-term sustainable benefits can be faster or slower, depending on the type of improvement process improvements is supported by the Red Queen effect.

In the same sense, Acemoglu and Robinson (2019, p. 41) stated that 'the Red Queen effect refers to a situation where you have to keep running just to maintain your position, like the state and society running fast to maintain the balance between them.' Abreu and Gomes (2021, p. 21) concluded 'a country needs always to be moving forward in governance practices to maintain its improvements and achieve anti-corruption results' to balance state and society powers.

Schmitter and Sika (2017) suggested that the Arab Spring did not change enough the democratic levels of the Middle Eastern and North African region. Roccu (2019) doubted the voice and accountability results in the Middle Eastern and North African after the Arab Spring. Nevertheless, Abrushouk (2016) suggested that a ruptured time for democratisation in a global context should promote better world voice and accountability results after the Arab Spring period. Hence, the first theory lack is if, after the Arab period, the world voice and accountability results increased significantly.

Moreover, Abreu and Gomes (2021) highlighted that it is unclear why Tunisia (the pioneer country of Arab Spring) balanced the state and the social powers, and the perceived corruption did not rise. Regarding those democratic initiatives (such as accountability ones) that should associate with corruption control by the Red Queen process (POTTS, 2009), the second literature absence point is if the world maintains the corruption levels after the Arab Spring period.

Thus, the paper's main objective is to verify if the world voice and accountability results had significant change and the world control of corruption maintained after the Arab Spring. This investigation justifies the accountability relevance to create value for society and the economy, including practical implications related, such as for United Nations (UN) members to reach the countries' Sustainable Development Goals (ABHAYAWANSA, ADAMS e NEESHAM, 2021).

Take note that the Arab Spring is the most recent broad democratisation wave described in the literature (ROCCU, 2019). The study of Arab Spring should expand the academic fields in public administration, economics, and political sciences. For instance, the controversy on whether or not the success of the Arab Spring occurred reflects a great window of opportunity to illuminate its uncleared still governance points, such as voice and accountability results (BIAGI, 2020).

Furthermore, the comprehension of corruption, voice and accountability results after the Arab Spring could suggest if the Red Queen effect occurs in public affairs to promote sustaining governance process improvement. Thus, this study should support scholars and policymakers in identifying how to encourage better government results and fill the theoretical lack on governance perspective.

The crucial contribution is that the accountability's advance reaches the Red Queen effect over corruption. Therefore, in the parasite race in corruption, an evolutionary strategy should be the stimulus for accountability improvements to maintain corruption control. In this sense, the governments should

advance in disclosing information, clearly publication, consistent report, objective communication, independence audit, citizen engagement, and the rule of law to maintain the corruption controlled.

The present work has five sections, including this introduction. The second presents the theoretical framework on accountability, the rule of law, corruption control, Red Queen effect, and Arab Spring and the hypotheses proposed in the literature to test. The third section describes the methodological aspects, such as this research uses an ex-post-facto method. The variables should combine in two multivariate regression models to verify both theoretical hypotheses. The fourth section presents the results and their discussions. And, the fifth section contains the main contributions and final considerations.

2. Theoretical framework

The following is a review of the public governance literature on public administration, economics, and political sciences, grouped into blocks related to the following themes: accountability, the rule of law, corruption control, Red Queen effect, and Arab Spring.

2.1. A review over public governance

Public governance is the stakeholder's interactive institutional system to provide outcomes of public policies (BOVAIRD, 2005), focus on self-organising relationships within society (OSBORNE, 2006), from traditions and institutions exercised by which authority in a country (KAUFMANN, 2008). As Bovaird and Löffler (2003) argued, good governance is more than delivering quality of services because it also means improvements in society quality of life.

To measure the quality of life from the governance perspective, the World Bank has been developing country measures intituled Worldwide Governance Indicators (WGI) since 1996 (APAZA, 2009). The WGI indicators have six dimensions: Voice and Accountability, Rule of Law, Control of Corruption, Political Stability and Absence of Violence, Government Effectiveness, and Regulatory Quality (WB, 2021). For instance, the WGI correlates to economic growth (SAMARASINGHE, 2018).

Nevertheless, the improvement in quality of life (as the corruption control) from adopting governance practices may not occur immediately (AVRITZER, 2009). This situation exists because the governance results associate with democratic state inadequacy due to the government officials and public managers' lack of social participation (AVRITZER, 2009; AVRITZER e FILGUEIRA, 2011).

Regarding Peters (2018) point of view, public governance means a complex set of institutions and actors, boundaries and responsibilities for tackling social and economic issues, relationships among collective stakeholders, self-governing networks, and society's capacity command to use its authority to deliver public policies. In this context, voice and accountability are crucial to achieving better good governance from society influence (ABREU e GOMES, 2021).

2.1.1. Accountability

Accountability means the ability to reduce public policy decision makers' opportunities to reach legal impropriety, corruption, bad administration results (IM *et al.*, 2017). In this context, accountability needs the rule of law conditionals to ensure its institutional framework to enforce society's voice in a democratic environment (ELBASANI e ŠABIĆ, 2018).

According to Bovens, Schillemans and Goodin (2014), from 2001 to 2006, the Congress of the United States of America (US) introduced the word accountability in the title of proposed bills' legislation more than 50 times each two-year cycle. In 2012, the United Nations General Assembly adopted Resolution 67/218, which recognises the relevance of transparency, participation and accountability in fiscal policies for promoting results on sustainable development (UN, 2021). In the discussion on Sustainable Development Goal 16 (Peace, Justice and Strong Institutions), the UN

members decided to link beyond the fail accountable institutions and the corruption increase (ABREU, 2017; UN, 2021).

For instance, Sohail and Cavill (2008) stated that worldwide construction corruption costs around $340 billion each year on public engineering projects. Greater accountability should constrain the corrupt practices (bribery, kickbacks, frauds, and embezzlement) in every construction project phase (SOHAIL e CAVILL, 2008; IM *et al.*, 2017).

Mackey and Cuomo (2020) argued that voice and accountability initiatives (using digital technologies) are crucial to combat corruption in medicines procurement in public health. As UN Sustainable Development Goals called to improve the health system's accountability, it is necessary to promote transparency and participatory actions to citizens exercise voice and claim for enforcement in a coordinated manner (VIAN, 2020).

As Bonvens, Goodin and Schillemans (2014) claimed, voice and accountability support democracy due to promoting collective influence in the governmental decision-making process. The collaboration in creating trust spaces can enable consensus' spaces from a collective discussion (ABREU, 2017). Therefore, some governance strategies are relevant to be encouraged to promote social voice and accountability, such as participation, transparency, digital platforms, risk management, emancipation, public hearing and audience, consultation, and informs (GUR e BJØRNSKOV, 2017; SANTOS *et al.*, 2017; ALMÉN e BURELL, 2018).

A state that does not relate to society tends to make despotic decisions, while a society without leadership from the state provides fertile ground for mismanagement (CHAMBERS, 1996). Explicitly on the relationship between state and society, Habermas (1995) stated that civil society constitutes an essential economic base capable of relating to the state, capable of promoting the public interest, being itself a relevant stakeholder to influence government results under the rule of law. According to Zalnieriute, Moses et al. (2019), improvements in the rule of law perspective should reduce the cost of the public policy decision-making processes to consider more accountability.

2.1.2. The rule of law

The rule of law depends on the balance between state and society and cannot disconnect from the democratic debate (BINGHAM, 2007). On the one hand, the individual living in society may leave a part of his freedom to accept the law constraints. On the other hand, the state may not do everything in its power (BINGHAM, 2007). Acemoglu and Robinson (2019) named this balanced path as the narrow corridor, which the states and the society should reach liberty's fate.

As Watson, Yap, Pino and Blaustein (2020, p. 131) argued, 'rule of law is not an end state but rather an ideal that all countries must continuously work to realise and sustain.' For instance, from COVID-19 crises' evidence, the inclusive decisions based on the rule of law perspective should contribute to more responsible and legitimate government decisions in a collaborative and peaceful mode (NORHEIM *et al.*, 2020; YAMEN, 2021).

The rule of law appears in various UN resolutions and reports (BLAIR, 2020). For instance, the rule of law is crucial to achieving the mentioned Sustainable Development Goal 16 (UN, 2021). From the Sustainable Development Goals point of view, the rule of law acts as a cornerstone for inclusive societies (WATSON *et al.*, 2020).

Following, some examples of recent omissions in the rule of law. Haiti has a low level of law culture, and its civil society complains about corruption in justice institutions (MARCELIN e CELA, 2020). In Uganda, the absence of the rule of law contributed to a parasitic relationship between private interests and government agents to affect foreign investments because of the trusty crises and promote violence (PASCULLI, 2020). The militarisation of citizen security results in the rise of violence and

corruption in Venezuela, aggravated by the accountability weakness caused by the rule of law's institutional failures (GAN, 2020).

The rule of law supports the voice and accountability improvement from the guarantee of social empowerment, delegation, and answerability (ABREU, 2017; ABREU e GOMES, 2021). A difficult in the rule of law, the accountability results should be in doubt. Hence, accountability should be a broad democratic process, where society should collaborate to rule for shared gains by the law (BOVENS, GOODIN e SCHILLEMANS, 2014). Hence, the voice and accountability core is the rule of law (POSTEMA, 2018).

First hypothesis: The rule of law impacts voice and accountability.

The destabilisation of the rule of law implies less voice and accountability and more costs, waste and inefficiency in public resources (IM *et al.*, 2017). The increase in corruption is just a consequence of a vicious process (IM *et al.*, 2017). As De la Croix and Delavallade (2011) argued, the rule of law correlates to corruption and income level. Hence, an unbalanced enforcement rule of law contributes to rising problems with voice and accountability and governmental corruption opportunities (PERUZZOTTI e SMULOVITZ, 2006; DE LA CROIX e DELAVALLADE, 2011; KIM e SHARMAN, 2014).

2.1.3. The Control of Corruption

Corruption is the pattern of behaviour that results in a private gain at the public expense, which 'deviates from the prevailing norms in a given context under a particular motivation' (ABREU e GOMES, 2021, p. 3). Vilhena (2018, p. 54) stated that 'corruption is an overwhelming problem' and 'it may not be possible to eliminate corruption at all stages; however, it has the potential to be contained within satisfactory boundaries.'

According to Shleifer and Vishny (SHLEIFER e VISHNY, 1993), 'the structure of government institutions and of the political process are fundamental determinants of the level of corruption.' Therefore, institutional and political factors are crucial to explaining why some countries have a higher level of corruption than others. For instance, the leak of transparency and enforcement make corruption more distortionary and costlier. The governments that do not control their agencies and policies tend to experience high corruption levels (CIEŚLIK e GOCZEK, 2018).

Therefore, the control or the benefit opportunity private gains at the public field should be the critical factor to control the corruption influences under the governmental decision-maker. From a governance perspective, the rule of law and accountability should be crucial for anti-corruption results (HOUGH, 2013). As Kaufmann (2004) argued, a narrow legalism emphasis overshadowed the possibility of emerging economies and rich countries advancing in governance practices, such as related to accountability, to restrict corruption occurrences.

Regarding that 'corruption is a phenomenon that plagues many emerging economies and is generally regarded as an important obstacle to economic development,' the corruption combat is essential to produce a fertile environment for prosperity (CIEŚLIK e GOCZEK, 2018, p. 323). The control of corruption aims to check the extent to which public power exercised for private gain, no matter if the corruption occurs shortly or broadly, as long happens governmental decisions supported by the interests of the private and elites (WB, 2021).

On the one hand, corruption can violate the impartiality rule as disinterest with a sense of justice among stakeholders because of the lack of accountability (SPARLING, 2018). On the other hand, corruption relates to political practices such as clientelism, patronage, nepotism, and physiologism. Moreover, it relates to political accountability as government decisions' legitimacy actions (ARAÚJO

e SANCHEZ, 2005; AVRITZER e FILGUEIRA, 2011). Hence, accountability is a crucial element to corruption control (RHODES, 1997; LÓPEZ-ARCEIZ e BELLOSTAS, 2020).

Second hypothesis: Accountability relates to control of corruption.

Similar to a parasite, corruption should be controlled, however not even entirely eradicated (VILHENA, 2018). In this perspective, accountability is a remedy to prevent corruption by transparency and participation initiatives to promote honestly and committed people in public life considering the rule of law (BRUSCA, MANES ROSSI e AVERSANO, 2018; VILHENA, 2018). Moreover, the balance of state and society powers supports accountability to combat corruption (ACEMOGLU e ROBINSON, 2019; ABREU e GOMES, 2021).

Evans (2018) concludes that scholars and policymakers spend more time lamenting its theoretical lack of understanding of the political will than discussions on practices manners of how to promote better governance results. Regarding this issue, the Arab Spring period is a fertile soil to match theoretical and practice on governance perspective (ABDELBARY e BENHIN, 2019).

2.2. *The Arab Spring*

The Arab Spring period occurred from 2010 to 2012 when concentrated society arrangements in the Middle Eastern and North African region for a better quality of life (MOGHADAM, 2018). The name Arab was because of the protest's impact in claiming democracy in the Middle Eastern and North African region, especially in Tunisia and Egypt (SPRINGBORG, 2011). Spring came from allusions to Springtime of Nations (in 1848) and the Prague Spring (in 1968), both social movements in Europe for a democratic environment (PERRIN, 2013; STEPAN e LINZ, 2013).

The Arab Spring erupted in Tunisia (December 2010) motivated by a police confiscation of a street vendor's vegetable cart named Bouazizi (ABREU e GOMES, 2021). In just a few hours after the cart's confiscation, Bouazizi set fire on himself in protest. According to Abushouk (2016, p. 55), 'this incident sparked a revolution in Tunisia and other Arab countries.' Although the Bouazizi's tragedy marked the insurgency's day, the protests' explosion was imminent because of the democratic wave against accumulated problems associated with the suppression of freedom of speech, limitation of liberties, the rule of law, accountability, and political corruption (PERRIN, 2013).

After the incident in December 2010, the protests spread beyond the Tunisia borderlines, reaching Egypt among other Middle Eastern and North African countries (SCHMITTER e SIKA, 2017). By the same motivation, the Arab Springs upsprings claimed freedom, democracy, and accountability (GRININ e KOROTAYEV, 2019). Abushouk (2016) concluded that the Arab Spring resulted from a world synergic governance movement for more democratic values.

Although the Arab upsprings appeared as a rupture of their countries' authoritarian history, the persistence of undemocratic evidence suggested that the Middle East and North Africa region did not advance as expected after this period. Schmitter and Sika (2017) argued for the suspicion on the Middle East and North Africa region's democratisation after the Arab Spring period.

For instance, the Tunisian society's desire for democracy is waning (SPIERINGS, 2020), and the accountability desire is rising (GABSI, 2019). And, the military institution maintains the authoritarian (SCHMITTER e SIKA, 2017). Therefore, conflict and instability continued in the post the fourth democratisation wave (ABUSHOUK, 2016). Bergh (2019) stated that the Middle East and North Africa are falling back into authoritarianism, and the region challenge remains to improve voice and accountability.

The new technologies and social media supported the mobilisation of the society for Arab protests by providing a voice to people (SMIDI e SHAHIN, 2017). For instance, social media collaborated for broadcasting protests to the wide world, gaining global support (GIRE, 2017). The new

technologies assumed an enormous role to influence people without distance barriers, and this phenomenon based on the Arab Spring case inspiring Arab uprisings for better life quality (FEKETE e WARF, 2013). Hence, the world digital transformation from new technologies and social media collaborated to open the mind of Middle Eastern and North African region people for the benefits of voice and accountability as the most recent democratisation wave (HOWARD e HUSSAIN, 2013; GRININ e KOROTAYEV, 2019).

Abushouk (2016) argued that the Arab Spring came from the fourth democratisation wave. The first occurred in the 1820s in Europe and North America. The second happens in the 1960s after World War II by the countries' fascist defeat. The third happened in the 1980s after the end of the Cold War because of the rupture of the soviet influence in East Europe and the finish of South America's dictatorships (VALBJØRN, 2012; ABUSHOUK, 2016).

The external actors' influence (European Community and the United States) combined with the expansion of urban educated classes and the digital communication transformations created an environment for context the authoritarian regimes that insisted on remaining in Middle Eastern and North African (ROCCU, 2019). Besides, at the same time, the world claimed as a synergistic governance movement for better accountability outcomes after de 2008 world economic crisis, whereby citizens mainly demand the rule of law and government openness (BLÜHDORN e BUTZLAFF, 2020). Hence, society should receive more attention from public managers and politicians after the Arab Spring period to achieve accountability because of the global governance movement (ABREU e GOMES, 2021).

Third hypothesis: The governance movement provokes the accountability's advance.

Regarding the accountability's increase should contain the corruption pressures. In this same sense, the world corruption results remain doubt after the Arab Spring period (ABREU e GOMES, 2021). The Red Queen effect should explain the achievement of long-term sustainable benefits (CHAKRAVORTY e HALES, 2016; ACEMOGLU e ROBINSON, 2019).

For instance, 'a country needs always to be moving forward in governance practices to maintain its improvements and achieve anti-corruption results' (ABREU e GOMES, 2021, p. 21). In this sense, collaborative innovation should support governance gains enabling greater sustainable long-term value co-creation (CROSBY, 'T HART e TORFING, 2017)

2.3. The Red Queen effect

The Red Queen effect means 'a situation where you must keep on running just to maintain your position, like the state and society running fast to maintain the balance between them' (ACEMOGLU e ROBINSON, 2019, p. 41). Besides, the pioneer Van and Van Valen (1973, p. 17) stated that the Red Queen effect is a biological evolutionary strategy that the parasitised species 'does the best it can in the face of these pressures' to maintain their status quo in following generations.

In this context, the Red Queen effect is a metaphor related to the Carroll (1917) book entitled Through the Looking Glass (DELACOUR e LIARTE, 2012). More specifically, from the following characters' conversation (DERFUS *et al.*, 2008), when the Red Queen spoke to Alice, 'Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!' (CARROLL, 1917, p. 33).

In public affairs, the Red Queen effect occurs when the ruler makes an effort to stay in power by attempting to control the evolutionary pressure (GARZARELLI e GALLI, 2020). On the one hand, control relates to an innovative effort to keep the political *status quo*, such as to make a new policy. On the other hand, the evolutionary pressure associates with harmful mechanisms that promote survival conditionals for undemocratic issues (VAN DEN BERGH e KALLIS, 2009; GARZARELLI e GALLI, 2020).

Delacour and Liarte (2012) stated that individual groups' behaviour performance should stimulate an evolutionary strategy to maintain the outcome levels. In this race, the success of survival means to be one step forward of others. Or, in other words, to run as fast as possible. Hence, this process ensures sustainable improvement results (CHAKRAVORTY e HALES, 2016) in the biological field or public affairs (POTTS, 2009).

Therefore, as Van den Bergh and Kallis (2009) argued, the evolutionary policy promote the Red Queen effect from a governmental adaptative and innovation initiative. In this sense, the political institutions should encourage co-value creation in maintaining the governmental *status quo* by undermining the undemocratic evolutionary pressure (GARZARELLI e GALLI, 2020). Potts (2009) claimed that the Red Queen effect is a policy result of adaptive and innovative strategy.

For practitioners, the knowledge of the Red Queen effect should guarantee a sustaining process improvement (CHAKRAVORTY e HALES, 2016). Regarding the use of adaptative and initiatives strategies 'to construct and retain a competitive advantage over time in turbulent, uncertain or extremely intense competitive environments' (DELACOUR e LIARTE, 2012, p. 315). For instance, by using new technology (DERFUS *et al.*, 2008; CAKMAK, 2014) and the enabling of value co-creation (SCHINDEHUTTE e MORRIS, 2010; BEST, MOFFETT e MCADAM, 2019).

The corruption remains active after the Arab Spring period due to the erosion and the barriers in accountability advances (ACHCAR, 2021). However, the recent world accountability streams seem to be an effort to corruption control (ABREU e GOMES, 2021). Therefore, the Red Queen effect over accountability initiatives should collaborate to balance the state and society powers in order to promote nations' corruption of control (ACEMOGLU e ROBINSON, 2019).

Abdel-Latif, Elgohari et al. (2018) concluded for ambiguous finding on corruption and economic growth, using the Arab Spring period as reference. The Arab Spring period estimated coefficients for corruption are not statistically different from zero, also from the Middle East and North Africa and other world regions. Hence, world corruption results suggested being regular overtime, despite the synergy between the Arab Spring period and the global governance movement (ABDEL-LATIF, ELGOHARI e MOHAMED, 2018).

In the same sense that 'any gain in fitness by one unit of evolution is balanced by losses in fitness by others' (VAN VALEN, 1977, p. 809), Abreu and Gomes (2021) claimed that the balancing of state and society powers maintain the corruption controlled. For instance, the ancient Athens' ruler Solon (in 6th $_{BCE}$) managed to reach the Red Queen effect reforming the institutional basis for more voice and accountability from popular participation initiatives (ACEMOGLU e ROBINSON, 2019). Hence, the Red Queen effect could run accountability in order to keep the corruption level (POTTS, 2009).

Fourth hypothesis: The Red Queen effect maintains corruption controlled.

Therefore, the corruption level's maintenance after a world stem effort for the accountability improvement should indicate the Red Queen effect from the Arab Spring period in synergy with the global governance movement.

3. Methodological Aspects

To attain this paper's objective, we test two models, the First (voice and accountability) and the Second (control of corruption). Table 1 discriminates both models' variables.

The research design on two complementary models considered the literature review on public administration, economics, and political sciences, focusing on the governance perspective. The First model results should test the First and the Third hypotheses (Figure 1). And, the Second model should verify the Second and the Fourth hypotheses (Figure 2).

Table 1. Type Variables per Model

| Var	Model and Type		Scale	Summarised Description
	First	**Second**		
VA	Dependent	Independent	0 to 1 (the higher means more voice and accountability)	The voice and accountability indicator indicates the public participation and the society freedom perceptions (in expression, association and media) for government selection (WB, 2021).
CC		Dependent	0 to 1 (the higher means more corruption control)	The control of corruption indicator refers to the private gain (the capture perception by elites and private interests) in public power (WB, 2021).
RL	Independent		0 to 1 (the higher means more the rule of law)	The rule of law captures the public agents' confidence in and abide by society rules regarding the contract enforcement quality, property rights, the police, the courts, and the crime and violence likelihood (WB, 2021).
AAS	Independent	Independent	0 and 1 (0 is before and during Arab Spring, and 1 is after the Arab Spring period)	The dummy variable Arab Spring period (asp) refers to a nine-year (from 2008 to 2017), whose period of the three latest years refers to the post Arab Spring moment (classified as '1'). The six early years' period refers to when the Arab Spring occurred and its three years before (classified as '0').
BAS	Independent	Independent	0 and 1 (0 after and during Arab Spring, and 1 is before the Arab Spring period)	The dummy variable Arab Spring period (asp) refers to a nine-year (from 2008 to 2017), whose period of the three firstest years refers to the before Arab Spring moment (classified as '1'). The six-year period refers to when the Arab Spring occurred and its three-year post (classified as '0').

Source: Authors
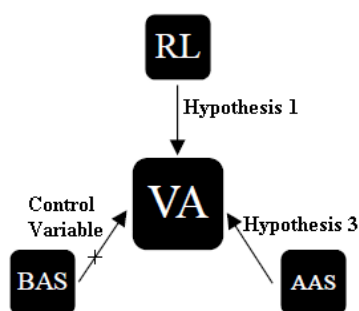
Figure 1. First model
Note. x means a non-significant relationship
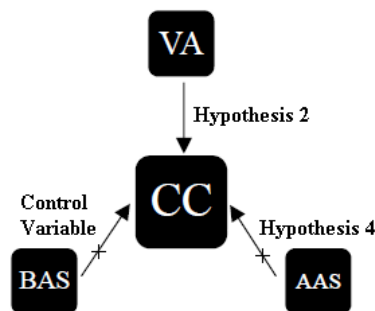Source: Authors

Figure 2. Second model
Note. x means a non-significant relationship
Source: Authors

The CC, VA, and RL are Worldwide Governance Indicators elaborated by Word Bank to be a tool for broad country comparative analyses and panel evaluating trends (WB, 2021). According to Kaufmann, Kraay et al. (2010, p. 56), CC, VA, and RL 'are clearly defined in a consistent way with some underlying theory.' Although Williams and Siddique (2008, p. 143) concluded that the Worldwide Governance Indicators are theoretically accurate and valid as 'super indexes,' but not wholly error-free, it combines various datasets.

The AAS (after Arab Spring) is a dummy variable that has the objective to check the existence of significant impact over the following Arab Spring period (in synergy and at the time of the global governance movement). Regarding the one-year gap from the Worldwide Governance Indicators' measurements and its effects (WB, 2021), the considered Arab Spring period set to contemplate the CC, VA, and RL results from 2011 to 2013.

Hence, the following three years period (2014 to 2016) in the post Arab Spring. In the same sense, BAS (before Arab Spring) is a dummy variable that has the objective to control if the results during the Arab Spring do not have a significant difference comparing to the previous period (2008 to 2010).

Hsiao (2007) heightened on balanced data for statistical analyses. The panel data is annually balanced from 2008 to 2016, covering 1,782 observations, and grouped in 198 countries (equivalent to the number of observations per year), excluding unpaired cases. Therefore, each of the three periods (before, during and post Arab Spring) marked by the dummy variables have the same number of observations (594).

Thus, this study should examine how the Arab Spring period impacts voice and accountability (First model) and control of corruption (Second model) results, regarding the four theoretical hypotheses. Based on Shadish et al. (2002), this is an ex-post-facto method. Regarding what Cohen (1992) stated, the variables should combine in two multivariate regression models. The statistical tests and their analyses (TORRES-REYNA, 2007; HAIR *et al.*, 2009) presented in this article generated using Stata.

4. Results and Discussion

The hypothetical models were tested (Table 2). In the First model, the dependent variable is VA, and the independent variables are RL, AAS, and BAS. The second model dependent variable is CC, and the independent variables are VA, AAS, and BAS.

Table 2. Summary of Statistical Results

Model (Dependent Variable)	First (VA)	Second (CC)
Intercept	0.3597***	0.3328***
	0.0276268	0.0365069
RL	0.2685***	
	0.0556633	
VA		0.3259***
		0.0743732
AAS	0.0042*	-0.0023
	0.0017556	0.0021185
BAS	0.0001	0.0001
	0.0018926	0.0015538
R-Squared within Groups	0.0925	0.0948
R-Squared between Groups	0.6590	0.5907
General R-Squared	0.6434	0.5786
Corr (u_i, Xb)	0.6758	0.5640
F (5.163)	8.92***	6.90***
Sigma_u	0.13200404	0.12818588
Sigma_e	0.02149231	0.02261735
Rho	0.97417567	0.96980822
Number of Observations	1.782	
Number of Groups	198	
Observations per Group	9	

Significance levels: '*' 0.05; '**' 0.01; and '***' 0.001
Panel Variable: Country Identifier (Id)
Time Variable: Year (2008 to 2016, strongly balanced)
Interval: Annual
Note: Robust matrix with a 95% confidence interval (fixed effects) is used
Source: Authors

The most appropriate panel regression models were with fixed effects based on the Hausman test application. The modified Wald test indicated heteroscedasticity in both models tested, so we decided to treat it using a matrix to estimate errors with a robust pattern. Both tested models (complete and reduced) were significant ($p<0.001$).

The RL and VA as independent variables moderated significant levels (p<0.001) of both models' dependent variables. On the one hand, the First model confirmed hypothesis 1 that RL reached VA. On the other hand, the second model confirmed hypothesis 2 that VA achieved CC.

The independent dummy variable BAS was not significant to control the dependent variables in both tested models. Therefore, The conclusion is that the observations before the Arab Spring period do not differ over VA and CC results comparing to other periods.

Nevertheless, the AAS dummy variable was significant (p<0.05) to moderate VA in the First model. Hence, confirming hypothesis 3. Consequently, more than 95% of the observations after the Arab Spring period presented higher accountability levels than the previous ones. In this sense, the world governance movement impacts accountability's advance.

The Second model confirmed hypothesis 4 because AAS was not significant to explain VA. Consequently, the later Arab Spring period do not have differences over CC comparing with the previous ones. Thus, the Arab Spring period evidence the Red Queen effect over corruption.

Figure 3 presented the relationship between the dependent VA and the independent variable RL. Comparing the regressions of post Arab Spring observations and the earlier ones confirmed significative accountability's advance after the Arab Spring period. The countries that increased their accountability after the Arab Spring period changed the modulation effect from RL.

The evolution of the country median observations per year in Figure 4 clarified the results of the regression of tested models. Although the median observations of VA and RL raised in 2013, the CC maintains its trends during the sample years.

Hence, the Second model and figure 4 demonstrated the Red Queen effect in action. This case is similar to what Caroll (1917) argued. In other words, the countries' accountability advance to keep their control of corruption in the same place. As Liarte (2012) argued, the behaviour performance of individual (in this case, the countries) groups should stimulate an evolutionary strategy to maintain the outcome levels (control of corruption).
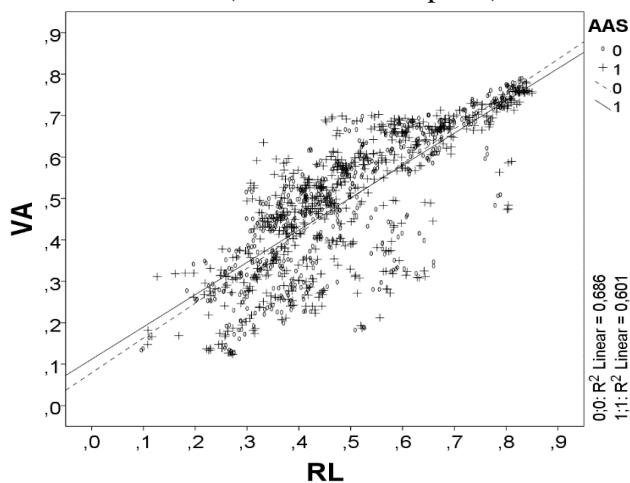

Figure 3. The accountability's advance
Dummy: **o** before and during Arab Spring; **+** after Arab Spring
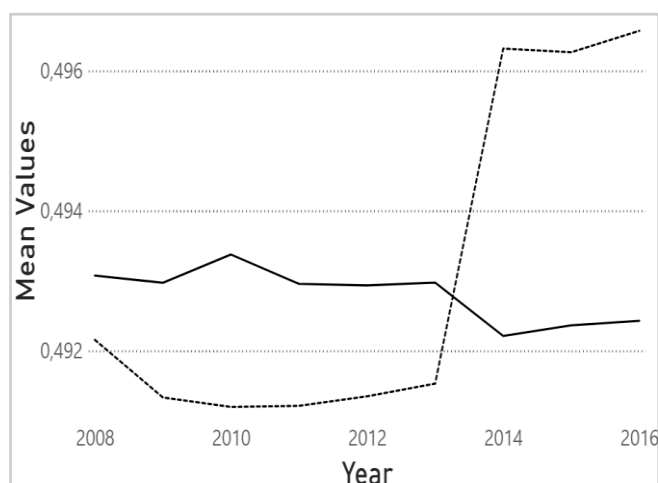**Source:** Authors

Figure 4. The Red Queen effect over corruption
Line: -- voice and accountability; – control of corruption
Source: Authors

Even though the significant change in the accountability mean results after the Arab Spring period, the fixed effect had a good fit (based Hausman test). The regression significance (of the Second model) confirmed the balance between corruption control and accountability outcomes in the tested sample. Therefore, the research results evidenced that the accountability advance should maintain the balance over corruption, similar to what Acemoglu and Robinson (2019) stated on the Red Queen effect from institutional governance changes.

Thus, the corruption perspective's parasite race should stimulate accountability advance as an evolutionary strategy to maintain corruption control. Consequently, ensuring sustainable and balanced results. In this concept, Abreu and Gomes (2021) concluded the promotion of co-value creation should be an alternative to support the anti-corruption solutions.

In the same sense, Schindehutte & Morris (2010) argued that the Red Queen effect from the defence advanced keeps the threat enemy out of range. Besides, policies should develop new technologies in response to technologies developed by others as an evolutionary strategy (VOELPEL *et al.*, 2005).

After the Arab Spring period, evidence showed that the accountability's advance came from a world governance movement and ran through the Red Queen effect over corruption. The global governance movement that occurred in concomitantly of Arab Spring increased world accountability differently from the literature stated for the Middle Eastern and North African region.

Hence, world accountability improvements should be taken into account from the academy studies and government initiatives in order to maintain corruption controlled. In this context, co-value creation initiatives should support adaptive and innovative strategies to promote the Red Queen effect.

5. Final Considerations

The paper's crucial contribution is that advances in accountability active the Red Queen effect to keep the corruption controlled. Therefore, in the parasite race in corruption, an evolutionary strategy should be the stimulus for accountability improvements to maintain corruption control. Consequently, this study expanded the literature related to academic fields in public administration, economics, and political sciences.

Starting from the theoretical and methodological considerations, the results of the research-tested models confirmed the four hypotheses. Hence, the main conclusions are: First, after the Arab Spring period, the world had a significant increase in voice and accountability results. Second, the control of corruption did not have a significant difference post Arab Spring.

The conclusion on the Red Queen's existence over corruption opens a window of opportunity to expand the governance literature to support accountability practices' improvement. The multilateral cooperation should help countries encourage intensifying efforts to enhance accountability, such as what previews the UN Resolution 67/218, adopted by the General Assembly on 21 December 2012 (UN, 2021) and the UN Sustainable Development Goals.

The practices for more transparency and participation are crucial to the accountability promotion (ABREU, 2017). For instance, the government's disclosure information, clearly publication, consistent report, objective communication, independence audit, citizen engagement, and law rule.

In this sense, when the corruption parasite tries to step forward in the evolutionary scale, the government already can quickly produce effective medicine based on accountability tools to control it. Otherwise, as Yamen (2021) alerted, inadequate accountability governments responses in the recently COVID-19 crisis affected the health policies and corruption prevention. In the biological field, different from public affairs, the scientists developed the vaccine as quickly as possible to control the coronavirus pathogenic (NORHEIM *et al.*, 2020).

Regarding the imminence of further crisis, the government should maintain running and advancing the accountability initiatives as fast as possible to keep corruption controlled. The Red Queen effect approach from a governance perspective is fertile soil for further studies. The lack of theory on this new theme in public administration, economics, and political sciences is hope for supporting anti-corruption policies.

Take note that the global governance movement influenced and was influenced by the Arab Spring. Thus, the synergistic world accountability after the Arab Spring period is a fact, although the results may not be the same in the Middle Eastern and North African. Therefore, new qualitative and quantitative studies could focus on the Middle Eastern and North African region to better understand this phenomenon.

The Red Queen effect theme in the public affairs perspective is emerging. The literature's absence press for further researches, such as: What elements describe and define it? Who are the stakeholders that support its occurrence? How should co-value creation initiatives support adaptive and innovative strategies to promote it? The corruption remains to pressure rich and poor countries to improve their governance control. Hence, the Red Queen effect theoretical expansion can support the identification of practical manners for governance movements promotion to enhance rulers' accountability and, consequently, to avoid private gains at the public expenses.

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